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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,552	04/02/2004	Mirsaid Bolorforosh	2004P03346US	2523

7590

07/06/2006

Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
Iselin, NJ 08830

EXAMINER

KITOV, ZEEV V

ART UNIT	PAPER NUMBER
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2836

DATE MAILED: 07/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/817,552		BOLORFOROSH ET AL.	
	Examiner		Art Unit	
	Zeev Kitov		2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2005 and 28 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Examiner acknowledges a submission of the amendment and arguments filed on November 9, 2005 and April 28, 2006. Claims 1, 2 and 12 are amended. New ground of rejection has been found. The Office Action follows.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. A reason for that is in following limitation of Claim 8: "the switch comprises a relay". However, as well known in the art, the relay is relatively slow mechanism and not being used for over-voltage protection when equipment is in active use. According to Specification ([0029]): "The switch 56 is closed when the transducer is not in use, such as to protect from electrostatic charges during manufacture or handling". In such case, the relay must be able to distinguish between manufacturing/handling process and active use of the system. Specification does not disclose a way the relay is controlled, or the way it distinguishes between manufacturing/handling and active use. Therefore,

one of ordinary skill in the art would not be able to use the relay, i.e. to practice the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 12, 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McIntosh (US22002/0124656) in view of Wilson (US 3,408,571). Regarding Claim 1, McIntosh discloses a capacitive membrane transducer (see Abstract and Fig. 2) sensing an ultrasound (Claim 8), including a flexible membrane (62 and 64 in Fig. 3) adjacent a void (between elements of the membrane and beneath in Fig. 3); and a conductor inherently connected with the flexible membrane (since otherwise the change in the membrane capacitance cannot be measured). However, it does not disclose and a voltage limiting circuit. Wilson discloses the capacitive membrane transducer (15 in Fig. 3) being connected by the conductors (16 and 27 in Fig. 3) to the voltage limiting circuit (17 in Fig. 3, col. 6, line 73 – col. 7, line 16). Both references have the same problem solving area, namely providing the capacitive transducers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McIntosh solution by adding the

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voltage limiting element according to teachings of Wilson, because as Wilson states (col. 7, lines 9 – 13), such voltage limiting element (zener-like transistor) protects other transistors in the circuit.

Regarding Claim 2, McIntosh discloses an electrode on the flexible membrane (paragraphs [0044] and [0046]). As to a signal trace connected to the electrode, it is inherent in the disclosed structure, since otherwise without connecting trace the system would not be able of functioning.

Regarding Claim 12, McIntosh discloses generating an electrical signal with variation between a first electrode on a membrane and a second electrode (64 and 62 in Fig. 3), the variation is flexing of the membrane (shown in Fig. 1 and 2). Wilson discloses limiting a voltage between the first and the second electrodes with a protection circuit. A motivation for modification of the primary reference is the same as above.

Regarding Claim 13, Wilson discloses holding a voltage between the electrodes substantially constant (col. 7, lines 10 – 14) due to zener diode like properties of the transistor protecting the amplifier transistors against any damage. The limiting voltage of the zener-like element is independent from and may exceed a breakdown voltage of the membrane. A motivation for modification of the primary reference is the same as above.

Regarding Claim 20, McIntosh discloses a capacitive membrane transducer (element 30 in Fig. 2), which has a membrane (elements 62 and 64 in Fig. 3), which is used to sense ultrasound (Claim 8). As to a high voltage protection, Wilson discloses

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the high voltage protection circuit (elements 352, 354 in Fig. 6, col. 9, line 49 – col. 10, line 13). A motivation for modification of the primary reference is the same as above.

Claims 3, 4, 14, 15 and 17 are rejected under 35 U.S.C. 102(b) as being unpatentable over McIntosh in view of Wilson and Shen et al. (US 6,160,691). As was stated above, McIntosh in and Wilson disclose all the elements of Claim 1. However, regarding Claims 3 and 4, they do not disclose two opposite connected zener diodes connected between a protected terminal and a ground. Shen et al. disclose two Zener diodes connected in series with opposite polarities (elements 15, 26, 28, 34 and 22 in Fig. 1) while some of pairs are connected between the protected terminal and the ground (34 and 22 Fig. 1). The reference has the same problem solving area, namely providing voltage-limiting protection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McIntosh solution by adding the pairs of back-to-back connected zener diodes connected between the protected terminal and the ground, because (I) Wilson demonstrated necessity for over-voltage protection of the capacitive membrane transducer, and (II) using two back-to-back connected zener diodes ensures protection against voltages of either polarity.

Regarding Claims 14 and 15, Shen et al. disclose limiting a voltage difference between the terminals by draining current away from them. In McIntosh system modified according to teachings of Wilson and Shen, the voltage between the membrane electrodes is limited. When one of the electrodes is grounded (as in Wilson circuit Fig.

3), the zener diodes are connected between the other electrode and the ground. A motivation for modification of the primary reference is the same as above.

Regarding Claim 17, in the McIntosh system modified according to teachings of Wilson and Shen, the zener diodes will provide shorting the electrodes one to another at any time including the time other than during performance. A motivation for modification of the primary reference is the same as above.

Claims 5, 6 and 16 are rejected under 35 U.S.C. 102(b) as being unpatentable over McIntosh in view of Wilson, Shen et al. and Kim (US 5,859,758). As was stated above, McIntosh Wilson and Shen et al. disclose all the elements of Claims 1 and 3. However, regarding Claim 4, they do not disclose the first and second diodes connected to the positive and negative voltages. Kim discloses the first and second diodes (elements 1 and 2 in Fig. 1a) connected to the positive and negative voltages (V_{dd} and V_{ss} in Fig. 1a), and protecting the internal circuit against over-voltages of both positive and negative polarities appearing at the input pad (col. 1, line 25 – col. 2, line 15). The reference has the same problem solving area, namely providing voltage-limiting protection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McIntosh solution by adding the non-Zener diodes connected to the positive and negative power sources according to Kim, because even though the reference circuit has some connection to the ground through resistor (element 356 in Fig. 6), its main path of the high voltage discharge is through a couple of Zener diodes, when one of them is always in an avalanche breakdown regime

with a substantial voltage drop across itself. Therefore, an ability of Zener diodes to withstand substantial discharge current is limited due to a power dissipation limit. In contrast, the Kim circuit has non-Zener diodes connected such that the discharging diode is always forward biased with a voltage drop across itself of about 0.7 V only, and therefore can withstand substantially higher discharge currents without being burned.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over McIntosh in view of Wilson and Bell et al. (US 4,630,162). McIntosh and Wilson disclose all the elements of Claim 1. However, regarding Claim 7, they do not disclose shorting the terminals, i.e. electrodes. Bell et al. disclose the over-voltage protection circuit, wherein in a case of an over-voltage a switch, transistor (Q3 in Fig. 2) is activated and short circuits input terminals (16 and 18 in Fig. 2), thus protecting the other circuitry. The reference has the same problem solving area, namely providing an over-voltage protection to the circuit terminals. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McIntosh solution by adding the switch shorting the input/output terminals according to teachings of Bell et al., because shorting the terminals when it does not interfere with the equipment performance, is a better way of protection of the terminals than the zener diodes can provide, since it not only limits the voltage, but in a case of McIntosh system modified according to Wilson, deactivates the amplifier input thus preventing appearance of undesirable signals at the signal processing equipment.

Claims 9 – 11, 18, 19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McIntosh in view of Wilson and Wagner et al. (US 5,430,595).

McIntosh and Wilson disclose all the elements of Claims 1 and 12. However, regarding Claims 9 - 11, 18, 19, they do not disclose the voltage limiting circuit being positioned at different locations such as within a transducer probe, integrated with preamplifier, or within a transducer connector. Wagner et al. disclose the protecting diodes (elements 21, 22 in Fig. 2) being positioned adjacent to the protected elements (transistors 41, 42 in Fig. 2, col. 7, lines 3 – 19). Both references have the same problem solving area, namely protecting the electronic circuits against over-voltages. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the McIntosh solution by placing the protecting diodes adjacent to the protected element, i.e. within a transducer probe, integrated with the preamplifier, or within a transducer connector of an imaging system (again to protect the preamplifier), because as Wagner et al. state (col. 7, lines 3 – 19), it is done to minimize the resistance between the anode of the diode and the protected element (transistor).

Additionally, according to the Court Decision *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965), mere integration of previously known elements does not present an invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the protecting diodes into the structure of the transducer probe, the preamplifier or into the transducer connector of an imaging system, since it has been held "that the use of a one piece construction instead

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of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice."

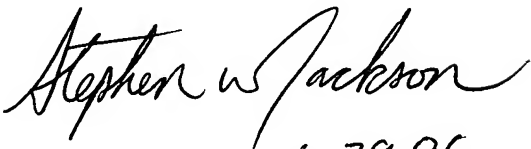
Response to Arguments

Applicant's Arguments have been given careful consideration but they are now moot in view of new ground of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose current telephone number is (571) 272 - 2052. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272 – 2800, Ext. 36. The fax phone number for organization where this application or proceedings is assigned is (571) 273-8300 for all communications.

Z.K.
6/28/2006



6-29-06

STEPHEN W. JACKSON
PRIMARY EXAMINER